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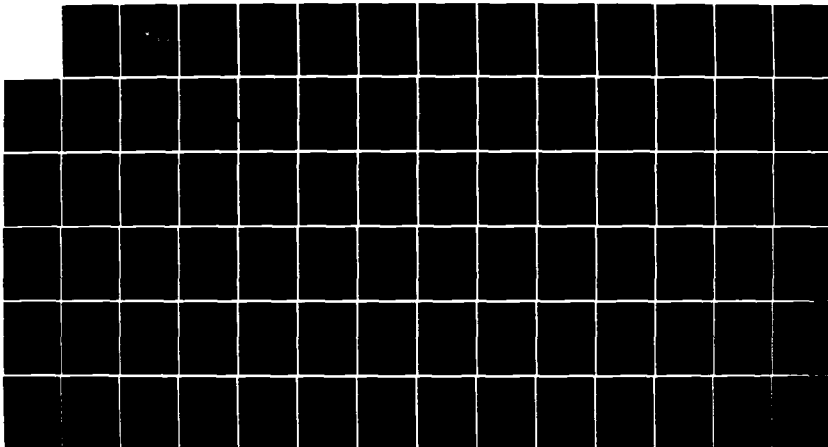
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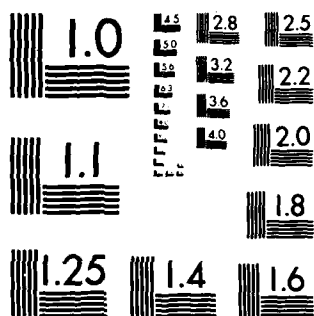
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## THESIS

COPYRIGHT LAW, COMPUTER SOFTWARE,  
AND GOVERNMENT ACQUISITION

by

Paul Raymond Dauphinais

September 1984

Thesis Advisor:

Norman Lyons

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Copyright Law, Computer Software, and Government Acquisition

by

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Submitted in partial fulfillment of the  
requirements for the degree of

MASTER OF SCIENCE IN INFORMATION SYSTEMS

From the

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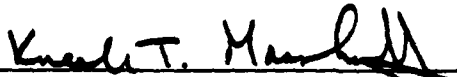
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## ABSTRACT

This thesis examines copyright law as it relates to computer software and how this law affects the Government acquisition of computer software.

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## I. INTRODUCTION

Agencies of the United States Government have become more and more dependent upon automated data processing (ADP) since 1951 when the Bureau of Census began to use computers. Today, almost all Governmental functions would be severely disrupted if the ADP facilities of various agencies were to cease operating. Payroll, retirement benefits, welfare, medicare, and communications functions, to name but a few activities, would come to an abrupt and untimely halt. For the military, in addition to payroll, benefits, and communications, logistics control, intelligence and information exchange, weather and sea condition prediction, searching huge files, and generating the reports to meet bureaucratic guidelines are all intimately linked to ADP resources.

As the Government agencies have become more aware of their dependence on computers, a maze of bulletins, circulars, reports, standards, studies, and directives have been issued to help the managers of ADP resources. In the 1960's and 70's a great deal of time and effort was devoted to hardware. Indeed, public laws have been enacted which control the manner in which Government agencies are allowed to purchase computer hardware. However, in the 1980's, hardware is no longer the central issue of data processing. Computers are becoming more and more similar. Hardware is now something that, Government regulations notwithstanding, can be purchased with relative

ease. Computer users with relatively up-to-date systems find that they no longer require new hardware every two to three years to keep up with the advances in the industry. [Ref. 1] They are finding that the equipment that they currently own can adequately meet their needs given the necessary software.

Software has become to the computer industry of the eighties what hardware was in the sixties and seventies. The software industry has grown tremendously during this decade. It is estimated that by the end of 1984 that the software industry will grow by roughly 300 percent from its 1981 level. [Ref. 1] Once a cottage industry, software is fast becoming a highly competitive undertaking, growing from an estimated market of \$2.7 billion in 1981 to over \$10 billion in 1984. [Ref. 1]

While federal regulations and public laws were enacted to ensure hardware acquisitions would be competitive, software is somewhat different. It can be written for any particular hardware, and in a variety of languages. Software can be made to be highly portable, it can also be reproduced by a user. Finally software doesn't wear out in the same way machinery does; it can usually be improved, but rarely becomes obsolete or useless. These characteristics make software markedly different from hardware for the ADP manager.

Laws have been enacted throughout the world to protect the rights of inventors and authors. Computer hardware is protected under patent law. But what is software? Is it a

process, an invention, or an idea? These questions have only started to be addressed, and are extremely important to any ADP manager. Taking advantage of current legislation, and protecting the Government as a user of software, are important issues which will be examined in the study. Only software acquisition and laws pertaining to software will be discussed. Hardware acquisition and its laws and regulations have been addressed in other works. [Ref. 2]

This paper will attempt to examine how present copyright laws affect how the Government acquires software, and what possibilities are open to the Government in acquiring software. This examination will be conducted through review of pertinent material, including Government regulations, newspapers, and legal documents. Additionally, interviews with individuals in Government positions and in private industry will be conducted to gain additional insight into the effects of copyright law on software and attendant procurements.

## II. BACKGROUND

Computer programs, generally called software, are basically a set of instructions for the computer to follow, or are a combination of instructions and information with the instructions pertaining to, or directing specified operations on the supplied information. Software comes in two basic categories: Systems Software and Application Software. Systems software is that which is closest to the hardware and least seen by the user. This type of software is generally known as operating systems, translators, or compilers. It is often written in lower level languages such as assembly language or machine language which are not easily read by human beings. Applications software is much closer to the computer user and interacts with the system software. Applications software is tailored to the individual user's needs such as financial management, word processing, filing, or indexing. The list is virtually endless.

Software of either type may employ one of three types of legal protection; trade secrets, patents, or copyrights. How appropriate any of these types of protection may be is dependent upon the particular situation, and the amount of protection desired.

A computer program, being intellectual property, is covered by trade secret laws. Trade secret protection is only

as good as those who have knowledge of the material. If the owner or author of the material allows facets of the product to become known then protection of this sort is no longer valid. However, if the knowledge was gained via espionage, theft, or other "bad faith" activities then some protection is offered, but only to the extent of suing those who disclosed the information wrongfully, or gained access in "bad faith". A party who uses the material in question, in this case a computer program, and through use and study makes a cognitive leap and produces a similar program cannot be prosecuted since he/she did not gain information through "bad faith" activities.

This is the weakest and least desirable form of protection, for if secrets are disclosed there is actually no protection since what is being protected, a secret, is no longer a secret. In the case of International Business Machine Inc. (IBM) and Hitachi, IBM lost several secret manuals to Hitachi through competitors in California. Although IBM successfully sued Hitachi, their secrets were known and no longer their private property. Moreover, as employees go from company to company secrets learned with a former employer will eventually be used, and disclosed through force of habit if nothing else.

Protection via patents is the second alternative. A patent enables its owner to keep others from constructing, selling, or employing any product covered by that patent, regardless of form, for 17 years. For instance, if an independent programmer were to devise a program and later sell

it, while another party had already patented a program identical in function, the independent programmer would be guilty of patent infringement even if his work was done independently and without knowledge of the patented work. [Ref. 3] It can be readily seen that patent protection offers a much wider scope of protection than do trade secrets.

While offering greater protection, patents are also more difficult to obtain. Specific requirements must be met in order for a work to be patentable. Such subject matter must exhibit novelty, utility, originality, and non-obviousness; moreover it must be a new and useful machine, process, manufacture, etc. At this point some definitions are in order. Novelty is defined as something unknown or unused in this country. Non-obviousness is evidenced if someone having an ordinary skill in the field in question would not fabricate or produce the item to be patented based on their ordinary skill. The criteria of utility is obvious. To satisfy originality, the applicant must be the inventor. Finally a mental process or idea is not patentable. To be patentable a process must "...act upon or change material to a different state or thing." [Ref. 3]

Patent applications must meet all of the above criteria. In addition, the application must be specific in nature. In O'Rielly vs. Morse, 15 How 62, (1854), Morse was allowed to patent a process which employed electromagnetism to produce distinguishable signs for telegraphy. However, Morse claimed

the use of "...electromagnetism however developed for making or printing intelligible characters...at any distance." This claim was rejected because of its broad nature with the following reason given by the Supreme Court, "If this claim can be maintained, it matters not by what process or machinery the result is accomplished.... But yet if it is covered by this patent...the public (could not) have the benefit of it without the permission of the patentee." [Ref. 4] The effects of this decision are readily apparent, and could be considered the first decision which affects the computer industry, although it came well before the computer as we know it was invented. The matter of specificity was also a factor in Gottschaulk vs Benson and Talbot, Supreme Court of the United States, November 20, 1972 405 U.S 915, where a method of converting binary coded decimal (BCD) numerals into pure binary numerals was at issue. Here claims were not specified in regards to apparatus, technology, or end use, and were eventually rejected by the Supreme Court.

In 1961 Charles D. Prater and James Wei applied for a patent. Their invention concerned finding spectrographic data for mixtures. The scope and workings of their invention are well beyond the range of this paper; however, it is important to note that this invention used a method and machine to accomplish its objective. There was no question about the utility, novelty, and non-obviousness of their work; but it was felt that this invention was of the "mental process"

variety, in that the physical limitation was how the representations were generated. In this case the representations could be made with pencil and paper, had novelty in only the mental sense, and were therefore unpatentable.

When this decisions was appealed, and finally decided in 1969, the Court of Customs and Patent Appeals felt that Prater and Wei were not trying to patent a process, but rather attempting to patent a "properly programmed general purpose digital computer performing their process". [Ref. 5] Their claims were rejected. With this decision, that of Gottschaulk vs Benson and Talbot, and a 1978 Supreme Court decision, it appeared that the issue of computer programs and mathematical formulas as patentable material had been decided.

This indeed seemed to be the case, until early 1980, when it was felt that the U.S. Patent Office was using the 1978 decision of the Court to reject all computer program applications. [Ref. 6] In 1980 the Court agreed to hear two cases involving patent applications for computer programs. [Ref. 6] One of the cases which invloved inventors from Honeywell Corp., was granted a patent. [Refs. 6,7] This particular case involves more than merely a program. Here the program was imbedded in a piece of hardware and an integral part of the computer. This program could not be removed as it was an actual component of the machine. This invention was eventually granted a patent. It would seem that software, or a program, as an item will continue to be unpatentable, while software



imbedded on a chip, or firmware, may be patented if it is an integral part of the machine. [Ref. 8]

It is interesting to note that in 1980 the U.S. Patent Office had no automated means for searching its archives. The Court's decision in 1980 sparked a great deal of interest in technology. One byproduct of this was that the Patent Office was directed to undertake a study so as to implement automated retrieval techniques for its archival searches.

The major drawback of patent protection for computer programs: It has historically taken a very long time to acquire a patent. The case of Prater and Wei ran on for eight years, as did the case of the inventors from Honeywell, and the outcome cannot be predicted. In the fast changing and highly competitive world of computers, eight years is an unacceptably long time to wait except for the most esoteric applications. With the time and difficulty involved in trying to gain patent protection it is reasonable to conclude that software producers will shun patents and turn to the more easily obtained copyrights. With this in mind the focus of this paper will now leave trade secrets and patents and concentrate on copyrights.

Copyrights stand between trade secrets and patents in both the ease of attainment and the level of protection. As can be seen, patents are extremely difficult to obtain, but offer tremendous protection to the owner. Trade secrets are relatively easy to claim, but offer little if any protection. Copyright applications must satisfy some preconditions which

are not as stringent as those for patents, and offers protection which benefits both the producer of the work and the software industry as a whole.

Copyright protection exists for original works of authorship "fixed in any tangible medium of expression,...now known or later developed, or otherwise communicated either directly or with the aid of a machine or device." [Ref. 9: 102]<sup>1</sup> These original works of authorship include literary works, musical works (including accompanying lyrics), motion pictures, graphic and audiovisual works, among other types of works. [Ref. 9: 102] Copyrights protect the description, explanation, illustration, etc. involved; but the material described, explained, etc. is not protected. In the case of software, the program can be considered an explanation to the machine. The explanation, or program, is protected; however, the idea or purpose of the program is not. As can be seen the only precondition for copyrighting a work is originality. However, only the work itself is covered, the premise written about is not.

Some definitions are in order at this point. In addition to completely original works the following are works that can also be copyrighted:

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<sup>1</sup>The numbers following a reference citation are paragraph identifiers not page numbers.

- 1) A group of previously copyrighted works can be copyrighted if they are combined in such a manner so that the result as a whole is also original. Works of this type are known as compilations.
- 2) A work of any type when it is created.
- 3) A work is created when it is fixed in a copy of some sort, be it paper, recording (tape or phonorecord), computer disk or tape, or whatever. Any amount of work so fixed is considered to be the work as of that time. If a work is prepared in different versions, each version is considered to be a separate work. [Ref. 9: 102]

The protection afforded by copyrights is longer than any other method previously discussed. A copyright protects a work for the duration of the life of the author plus fifty years in most cases. [Ref. 9: 302] The owner of a copyright has the following exclusive rights:

- 1) To reproduce the copyrighted work.
- 2) To prepare derivative works based on the copyrighted work.
- 3) To distribute copies to the public via any number of means.
- 4) To display the work publicly
- 5) To perform the work publicly. [Ref. 9: 106]

Although it would seem that these rights are rather straight forward, this is not always the case. For instance, it is not an infringement of the exclusive rights of a copyright owner to copy a work within the limits of fair use. Fair use is a rather nebulous term, and must be determined on a case by case basis. In determining fair use the copyrighted work being copied, the amount copied, the substantiality of the material copied, the purpose and the use of the copy are all

taken into account. [Ref. 9: 107] In general it is not considered an infringement to reproduce a copyrighted work for educational purposes. Infringement is a subject in and of itself and will be studied separately. The remedies for infringement, however are quite simple. The owner of a copyright who has had his/her exclusive rights infringed upon has several options. The owner may seek an injunction against the offender and the product of the offender, or may have the infringing articles impounded, and/or may sue for damages profits, costs and attorney's fees. [Ref. 9: 502,503,504,505]

Protection of computer programs using copyright law is feasible, easily obtained, and the protection offered is adequate in both strength and longevity. This method has all the advantages of patents and trade secrets but none of the drawbacks. Unless there is a drastic change in the software industry, or a dramatic revision in the current copyright law, copyright protection will be that most often sought by the authors of computer programs. Table 1 in Appendix B illustrates the different types of protection available.

With the basic ground work laid this study will look at how current copyright law and Government software acquisition practices evolved, and finally how the manager of a Government ADP facility can protect his/her installation from unwittingly falling victim to an infringement suit, and how, if possible, to take advantage of copyright laws.

### III. EVOLUTION OF PRESENT COPYRIGHT CONCEPTS

Copyright, as we know it in the United States, traces its roots back to a 1710 English statute known as the Statute of Anne. Shortly after the American Revolution, laws, generally modelled after this statute, were passed in most states. It became obvious that one central law was required, and the principle of copyright was written into the constitution. [Ref. 10] Congress is granted the power, via Article I section 8 clause 8, to "promote the progress of science and useful arts by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries." It can be seen that copyrights or patents have two primary functions; first to promote the creation and distribution of works for the good of the general public, second to allow those who create these works to reap the rewards due them.

Enacted in 1790, the first federal copyright statute in this country covered maps, books, and charts. [Ref. 10] There were general revisions approximately every 40 years in 1831, 1870, and 1909. The 1909 act stood essentially unchanged, for nearly 70 years. Passed into law before the advent of radio, television, the photocopying machine, etc., this act was woefully out of date in the 1950's. In the pre-electronic era the creation of a duplicate was costly and time consuming. There was no question that the holder of the copyright could

successfully stop the infringement before the infringer could recover his/her costs and investment.

Today we are no longer in the manual, or Gutenberg era. [Ref. 11] In the post-Gutenberg era the 1909 copyright act was totally inadequate. The need, however, for a new, or at least revised act, was seen in 1924 when efforts to change the 1909 Act began. Four efforts took place before World War II, the Dollinger, Perkins, and Vestal Bills in 1924-1931, in 1932 the Serovich Bill, the Duffy Bill of 1934-1936, and finally the "Shotwell" Bill of 1939. [Ref. 12] None of these bills ever got through more than one house of the Congress. [Ref. 12] It is generally human nature to blame special interest groups for the failure of legislation to get through proper channels. In this case the reasoning is only part of the answer. Efforts were made to permit U.S. adherence to an international copyright convention. There can be no doubt that opposition to the proposals stemmed from the American distaste for accepting foreign principles. [Ref. 12]

After World War II efforts to amend the 1909 Act resumed. At this time efforts to change copyright law saw the changed status of the United States, and realized that a new multinational copyright agreement was in order to meet the emergence of the U.S. as an exporter of cultural materials. Revisions of domestic law were shelved in favor of a new international treaty. In 1952 the Universal Copyright Convention (UCC) was signed in Geneva. [Ref. 12] The way was now clear for a General revision of the 1909 Act.

In 1955, the process of revising the 1909 Act began anew. Rather than a complete history of the process, a brief sketch is offered.

- 1) 1955-1961: Panel of consultants formed, issues studied and analyzed, studies published.
- 2) 1961-1962: Register of Copyrights Report published and debated.
- 3) 1962-1964: Preliminary drafting of revision bill, review of draft language, redrafting.
- 4) 1964-1965: Redrafted bill introduced, House completes hearing, Senate begins.
- 5) 1966: Bill again redrafted.
- 6) 1967: Bill reconsidered, cable T.V. proves to be irreconcilable problem.
- 7) 1976: New revision bill introduced, debated in both houses of Congress and signed by President Ford in nine months. [Refs. 10, 12]

The major issues which kept the various revision bills from gaining acceptance were juke box performances, cable T.V., community antennae, and photocopying machines. These areas were finally settled by compromise. Juke box performances and cable T.V. systems were found, at least theoretically, to be liable for copyrights. Community antenna systems were dropped from the bill entirely, and instructional uses were broadened. [Ref. 12]

The advent of the photocopying machine and other quick, inexpensive copying was a major point of contention. As a direct consequence of these technological advances, several limitations of the exclusive rights and definitions were

included in the 1976 Copyright Act (hence forth referred to as the 1976 Act) so as to alleviate confusion and to take into account consideration of the rapid advance of technology. Definitions pertinent to computer programs are listed in full in Appendix A.

A review of these definitions shows that Congress was indeed farsighted when writing and passing the 1976 Act. By allowing for "devices, machines, or processes now known or later developed" the legislature let it be known to private industry and to the other branches of Government, that copyrights in an age of rapid technological advance should not be considered archaic. Protection for a work would be maintained in the face of a fast evolving society. This point is extremely important to those who write computer programs. The constant advance of computer technology and the rising tide of compatability in both the mainframe and personnal computer (PC) worlds pose real challenges for those who wish to maintain their exclusive rights in copyrighted works.

The owner of a copyright under the 1976 Act has five exclusive rights. He/She may: 1) reproduce the work in copies; 2) prepare derivitive works based on the original work; 3) distribute the work, or copies of the work, via sale, transfer of ownership, or by leasing, renting, or loaning the work; 4) perform the work; 5) display the work publicly. [Ref. 9: 106] These exclusive rights would seem to furnish the copyright holder with a virtual monopoly. This, however, is not the



case. Several limitations exist so that the public at large, as well as the copyright holder, may benefit from the work. Both factions, copyright holders and the public at large, are the reason copyrights exist in the constitution.

Libraries are allowed to make copies of copyrighted works for archival and lending purposes. Copying for lending is restricted as to commercial benefits, upon the condition that the institution is open to the public and that the copyright notice is affixed to the copies, among other limitations not germane to this discussion. Copyrights are not infringed upon if ownership of a legally made copy is transferred without the authority of the copyright holder. There are many further limitations which do not relate to computer programs; however there are two remaining items which are of major importance.

The first of these is fair use. The 1976 Act briefly touches on the subject, and essentially states that in each instance fair use will be decided on the merits of that particular case. Scholarship, comment, research, criticism, and teaching (for the classroom) are specifically mentioned as being purposes which are not infringement. [Ref. 9: 107] Fair use, as a doctrine, is practically a body of law unto itself, being derived from a series of court decisions in copyright law, and extends back well before the 1976 Act. [Ref. 13] Fair use concerning a novel differs from that of a text book, an encyclopedia, or a computer program. The

concept of fair use endeavors to provide a balance between the interests of the parties concerned with the copyrighted work. In its most simple form, fair use is a privilege for others to use copyrighted material reasonably without the expressed permission of the copyright owner. [Ref. 13]

For computer software an additional fact must be taken into consideration. In science and technology there exists factual information which, by its very nature, is not copyrightable. The Supreme Court has stated "Where the truths of a science or the methods of an art are the common property of the whole world, any author has the right to express one, or to explain and use the other in his own way." [Ref. 13] By this statement, unlimited use may be granted to particular elements of a work. However, this does not guarantee that infringement is impossible, the point must be made as to what is and is not protected.

The question of what is and is not protected is not easily answered and, like the larger issue of fair use, must be decided on a case by case basis by the courts. The courts have provided a broader interpretation of the law when Governmental use or noncommercial interest has been shown. [Ref. 13] This is not a guaranteed decision by any court. While noncommercial intent may generally result in a favorable decision by the court towards those accused of infringement, the Government may indeed be held liable for copyright infringement. Two Government employees were found to be liable for damages

after reproducing copies of a copyrighted map for their use on Governmental duties in Towle v. Ross 32 F. Supp. 125 (1940). [Ref. 13] Some may consider the map to be scientific data. A mountain or river is where it is due to nature and is not the original work of any man. It is a fact that it is there, and the map merely a representation of its existence. It is the representation that is protected. Although the copyright laws have been revised since that decision, fair use as a concept continues to evolve. With the growing use of data bases eventually what data is or is not protected will certainly be a new and hotly debated issue.

The second important limitation which concerns the subject of computer software is the ability of the Federal Government to hold copyrights. Under the 1976 Act works of the United States Government (see Appendix A) may not be granted copyright protection. This does not preclude the Government from holding copyrights transferred to it. [Ref. 9: 105] The Government must obtain rights via contractual agreements. This subject will be addressed more fully in a later chapter.

The 1976 Act says little concerning computers. It essentially states the act as an entity holds true for computer programs. This deficiency was corrected in 1980. [Ref. 14: 117] In this act the Congress made a specific amendment to the 1976 Act. The broad statement concerning computer programs was made much more detailed in nature. It was amended so that

the making of a new copy required for the utilization of the program was not an infringement. Now programs could be taken from their physical copy and placed into memory without infringement. The amendment also stated that a copy could be made for archival purposes, but that a copy must be destroyed in the event of the program's discontinued use or legal ownership. The amendment went on further to say that copies made in accordance with the above requirements could be sold, leased, or transferred, but only in the sale, lease, or transfer of all rights to the program. Finally, any adaptation of a program could only be transferred with the authorization of the copyright holder. [Ref. 14: 117]

With the 1980 amendment to the 1976 Act copyright law would appear to be quite stable. The arguments and reasoning in both the courts and the private sectors have, since the sixties, proven that this is not the case. Long before the 1976 Act and its subsequent amendment, computer programs as a subject of copyright have been the subject of many heated arguments in the courts and in academic circles.

In the mid 1970's there was some doubt as to whether computer programs met the primary test of copyrightability; namely that the work is in fact the writing of an author. Those who held that programs were not copyrightable material contended that programs were no more than a set of instructions for the hardware components of a computer to follow, a process, more ideally suited to other forms of legal protection.

Others held that there was nothing in a program of any sort that human beings couldn't do given enough time or an adequate labor force; or that programs were indeed writings understandable to human beings, not just the machine. Another argument was that a program was not written in a language readily understandable to people in general. While this was (and still generally is) true, it has been pointed out that sheet music (not accompanying lyrics), sculpture, graphic, and other types of work which are certainly copyrightable do not relate to human beings by means of any natural language. One Government booklet stated, "...the computer program is an implementation of the view that the physical world and at least that part of the human world which is amenable to rational analysis and quantification, and to understanding deduced from these processes." [Ref. 15] The article later says, "Copyright protection...requires no value judgement as to the individual merit of a particular writing of an author; and it is clear that the source code written by a programmer is such a writing." [Ref. 15]

The protection of source code by copyright would seem to have negligible value if the object code were not similarly protected. In the seventies this idea was argued. It would appear on the surface that taking code of one form and reproducing it in another could be considered a derivative work, or even a different version altogether and be available to copyright protection of its own. In this case the test of

original authorship can be pressed. [Ref. 15] It has since been decided in the courts that either type of code is copyrightable. [Refs. 16.17]

It has only been within the past two years that the courts have begun to hand down decisions which clarify how software will be handled under the 1976 Act. The 3d U. S. Circuit Court of Appeals decided on 30 August 1982, to overturn an earlier District Court decision which denied Apple Computer Inc. an injunction against Franklin Computer Corp. for copying 14 copyrighted programs. [Ref. 17] This was the first appellate court review of computer programs under the 1976 Act. In this case Franklin admittedly copied the programs, all operating systems, from Apple. The District Court denied the injunction because it doubted the copyrightability of an operating system, possibly feeling that the operating system was merely a set of instructions to follow, a process. [Ref. 18] The Circuit Court reversed the decision, holding that Apple ROMs and diskettes were copyrightable and protected under the 1976 Act.

The decision addresses two points which are quite relevant to this discussion. First is the issue of object code as copyrightable. This decision shows that it is copyrightable material. The court held that there is no reasonable basis for treating object code or source code differently. [Ref. 17] Although it could be reversed by a higher court in the future,

there are no cases pending higher review, nor is there evidence that this decision will be challenged in the near future. Secondly, the decision classified an operating system as an idea, not as a "system" or "process", and hence copyrightable under the 1976 Act. These works are undoubtedly the original work of an author within the view of the 1976 Act. It is interesting to note that the same circuit court, three days later, handed down a decision based on Apple v. Franklin in Williams Electronics Inc. v. Artic International Inc., 685 F. 2d 870 (3d. Cir. 1982).

In early 1984 a similar case was decided in Northern California. [Ref. 16] Here IBM sought, and won, relief from alleged copying of part of its PC operating system by Eagle Computer Inc.. IBM's suit was not contested by Eagle. In view of the Apple decision and the IBM case, precedents seem to have been set, and some clarification of copyrights and computer programs has emerged.

This apparent clarification should not be taken as the final word on the subject. Case law is an evolutionary thing in this country and there is little case law pertaining to software copyrights. Moreover, there remain issues as yet unaddressed and unresolved. In light of the continued evolution of the concepts and the unresolved issues, it is imperative that any individual in a position to purchase or otherwise acquire software be able to adequately protect

him/herself and/or the employer from procuring "illegal" software. It is equally important for those who write software to be wary of infringing on established copyrights. This holds equally true for Federal agencies as it does for private industry.



#### IV. GOVERNMENT SOFTWARE ACQUISITION GUIDANCE

The acquisition of software by the Government is in many ways similar to that of hardware. Commercial software, like ADPE, may only be purchased after approval has been granted by the General Services Administration (GSA), except in specific circumstances. According to the DoD Supplement to the FAR (DFAR) there are four instances where prior delegation of authority by GSA is not required. These instances are:

- 1) Procurement by placing purchase/delivery against a GSA requirements type contract.
- 2) Procurement by placing purchase/delivery under the terms and conditions of a GSA schedule contract.
- 3) Procurement from the Federal Software Exchange Center (FSEC).
- 4) Procurement under normal solicitation procedures with the total value of the action, excluding maintenance, not exceeding \$1,000,000 for competitive, \$100,000 for noncompetitive, or the software is provided with ADPE. [Ref. 19: 70.302-2]

Like ADPE, software is specifically delineated. Software is defined as computer programs of all types, operating systems, assemblers, compilers, data base management systems (DBMS), and documentation. Firmware, whether it be furnished with the ADPE or acquired separately, is also considered software.

If the prospective software does not fall into the above four categories from the DFAR then the agency seeking to procure software must submit an Agency Procurement Request (APR)

to GSA. [Ref. 19: 70.302-1] When software is acquired via this route the acquisition process is identical to that of ADPE. Moreover, software must also adhere to other guidance which addresses competition, small business concerns, sole source procurements, labor surplus areas, etc.

The FSEC is administered by the GSA or its authorized representative under the supervision of GSA. [Ref. 19: 70.1300] This center holds software for release to various Government agencies, cost-reimbursement contractors, and federally funded activities among others. While the FSEC is a fine idea, it is of limited use to some agencies. The FSEC holds software that is quite limited in type. For the most part the holdings of this center are limited to software for a specific system, and not applicable to the many different types of computers in use in the Government. [Ref. 20]

The central directions set forth in the DFAR and FAR give general guidance to Government agencies. Some agencies have developed practices to supplement this general guidance with the aim of saving time, money, and legal problems with commercial software. The U.S. Army for instance, develops all of its application programs for mini and mainframe computers within the Army and contracts for operating systems, and PC software. [Ref. 21] To ensure that no duplication of effort takes place a sort of Army central clearing house is maintained. While the Navy contracts for more software than does the Army, it too attempts to develop as much software as

possible internally. The Navy maintains an End User Software Exchange Program which is essentially for PC software developed by DON employees. Both of these programs are maintained to serve the same purpose as the FSEC.

As has been stated the general mechanism for Government acquisition of software closely resembles that of ADPE. Like hardware acquisition, software requires decisions as to whether to rent, lease, or buy; what the useful lifespan will be; and where to acquire the product. Unlike ADPE, some of the more specific decisions are not so clear cut. Hardware requirements are relatively clear cut as to memory capacity, computing power, and the placement of the new assets. Software requires that some unique decisions such as the scope of rights to acquire in the product, the limitations of the licensing agreement, how many copies to obtain, the legality of the product, how soon the product will be required, the reputation of the firm, and the form of the product.

While all of the above mentioned factors are important, a different aspect is more immediately noteworthy: What specific guidance to follow in regards to the legal ramifications of commercial software? The Federal Acquisition Regulation (FAR) which went into effect on 1 April 1984 and superseded the Defense Acquisition Regulation (DAR) contains minimal guidance concerning policy and practices in this area. The original publication of the FAR in the 19 September 1983 Federal Register made no mention concerning copyrights or

other legal concerns involving software. As late as 30 March 1984 the FAR was amended to provide "general coverage" for the procuring of rights in software, but stated that "Additional coverage in this area is being developed". [Ref. 24] While the FAR contains no clear policy, and the DAR and Federal Procurement Regulation (FPR) have been superseded, more specific guidance is contained in the Department of Defense Supplement to the FAR (DFAR).

Some policies of the DAR concerning the acquisition of software are reiterated in the DFAR. These policies concern the timing of ordering and taking delivery of software. Since the need for software can arise spontaneously, but the ability to implement it may not be onhand at the moment, the DAR contained policies concerning ordering and delivery. These policies were called deferred ordering and deferred delivery. The DAR justified delaying by citing the need to reduce Government storage requirements, receiving a more current product, and economy. [Ref. 23: 9-502] New applications for large systems are normally custom made and require a long process involving both the contractor and the user. In a case such as this, deferred delivery would be employed. This method is the most practical method of procuring software of this type. It allows for the long lead time required for a quality product, for the inevitable changes in the development of the product, and for more exhaustive testing. All of these points are mentioned prominently in the current

literature as the major problems confronted by those acquiring and producing software. In the case of a large special application, deferred ordering would exacerbate the problems encountered in the development and testing process by placing them under severe time constraints. Deferred delivery would allow the Government to reduce its storage time and to get a more current program which has been more thoroughly tested. Economy could also be realized since the contractor, given adequate time, would not have to pay overtime to employees trying to meet a deadline. However, the purchase of an off-the-shelf product would benefit from deferred ordering. By waiting until the product was actually required the Government could get a more current product by possibly taking advantage of vendor improvements to the product, and would not be required to store it.

The issue of rights to acquire in software is one of both monetary and legal concern. Rights have the potential to drive the cost of a product to astronomical heights as well as depriving the Government of wide use of the product or possibly involve it in a breach of contract action. There are three types of rights which the Government may acquire; limited, unlimited, or restricted. [Ref. 19: 27.400, 24] The FAR is still being finished in respect to rights. [Ref. 24]

Limited rights allow the Government to use, duplicate, and/or disclose the material within the Government or agency, but it cannot be disclosed or released outside the Government

or used for the manufacture of software by the Government without the express written permission of the party furnishing the software, except for emergency repair or overhaul work with the stipulation that any release outside the Government will be subject to a prohibition against further use; and except for release to a foreign government as the Federal Government interests may dictate. [Refs. 19: 27.401, 24] Unlimited rights essentially allow the Government to do anything it wishes with the product. [Refs. 19: 27.401, 24] Restricted rights apply only to computer software, and as a minimum include the right to:

- 1) Use of the software with the computer for which or with which it was acquired, including use on any Government installation to which the computer may be transferred by the Government.
- 2) Use of the software with a backup computer if the computer for which or with which the software was procured is inoperative.
- 3) Make copies for archival or backup purposes.
- 4) Modify the software, or combine it with other software, subject to the provisions that portions of the derivative work incorporating restricted rights are subject to the same restricted rights. [Ref. 19: 27.401]

Restricted rights also include any other specific rights listed or described in a license or agreement not inconsistent with the above listed minimum rights. [Ref. 19: 27.401] A major difference between the DFAR coverage of rights and the now superseded DAR is the insertion of "Restricted Rights".

As previously mentioned, ADPE can be quantified as to memory capacity, speed, and overall computing power to fulfill a need, the issue of rights, however, cannot always be quantified. Unlimited rights essentially rob the copyright

owner of the protection provided by law. As can be seen from Table 1, one of the ways to lose copyright protection is to grossly neglect the product. By issuing unlimited rights to a user, the copyright owner runs the risk of having a third party gaining legal access to the product, making some modifications, and later marketing the product. The product may also become so widely known or copied that it could fall into the public domain and lose its legal protection. Fearing this, vendors require substantial payments for unlimited rights in the rare event that these rights are assigned. This fear is so great in the industry that some software producers have refused to do business when contracts contain clauses for unlimited rights with a company. [Ref. 25] Unlimited rights would be advantageous to obtain in all cases, however, the cost would prove to be prohibitive. Moreover the acquisition of off-the-shelf software could probably not be accomplished if unlimited rights were involved. It may, however, be possible to acquire these rights in some esoteric scientific applications.

The Government receives unlimited rights when it provides research and development money for the project, finances the development of software required to complete part of a larger project, or when it issues what is required to construct the software. In other words, when the Government supplies required resources it receives unlimited rights. Generally

it is Government policy to have unlimited rights in:

- 1) Software resulting from research and development which is an element of performing a Government contract or subcontract.
- 2) Software required to be originated/developed under a Government contract.
- 3) Databases prepared under Government contract consisting of:
  - a) Information supplied by the Government,
  - b) Information in which the Government has unlimited rights,
  - c) Information in the public domain.
- 4) Software prepared or required to be delivered under a Government contract and constituting corrections or changes to Government furnished software.
- 5) Public domain software, or software normally provided without restriction. [Ref. 19: 27.401-1]

In the case of software developed at private expense DoD policy is to "acquire only such rights to use, duplicate, and disclose computer software...as are necessary to meet Government needs." [Ref. 19: 27.404-1] These rights must take into account the ability to preserve the rights of the contractor while allowing the Government some measure of flexibility. [Ref. 19: 27.404-1] Further the copyrighted software will not be subject to any agreement prohibiting Government infringement. [Ref. 19: 27.404-1] In this area limited and restricted rights apply.

Limited rights would seem to be the most economical avenue open for the majority of commercial software where Government flexibility is the paramount concern. Although limited rights place some prohibitions on what can be done



with the product, there is still a possibility of the product being compromised, as a result vendors may place additional constraints on the software. [Refs. 20, 26] These constraints are normally in the form of what machine the software can be run on and/or geographic limitations. [Ref. 26] The additional constraints change the scope of the rights from limited to restricted. The more constraints placed on the rights acquired reduce Government flexibility while increasing contractor protection. Additional constraints can also serve to reduce the cost of the software. These practices by vendors influence the manner in which software is acquired. The procurement of rights can influence whether or not GSA approval must be obtained as unlimited rights can drive cost. Likewise, the number of machines that the product will run on can also influence price.

Constraints for privately developed software must have the required rights to meet Government needs. [Ref. 19: 27.404-2] The contract must delineate the restrictions on the Government, but such restrictions will only be acceptable if they permit the Government to fulfill the need for which the software is being procured. [Ref. 19: 27.404-2] If the contract is found to be satisfactory by all concerned the product is required to have a restricted rights legend to be "prominently displayed" in a form readable to humans in the

software documentation. [Ref. 19: 27.404-2] The legend must also be displayed on the software itself, or on a disk drive, card, etc. so as to identify to the users the restrictions placed upon the product. [Ref. 19: 27.404-2]

These vendor constraints are usually contained in the licensing agreement. These limitations normally take the form of CPU serial numbers of the machine on which the software will run. Additionally there may be geographical constraints as to the location of the machine. In some cases if the machine is moved or ownership of the machine is transferred the software agreements must be renegotiated. [Ref. 26]

The license can also contain provisions for improvements or corrections to the software known as updates, or for an essentially new product which performs the same function better known as upgrades. [Ref. 26] Both upgrades and updates are copyrighted, hence unless provisions were included the license either would have to be later purchased with their own agreements. The advantage of including these provisions is that both items are provided by the vendor at a reduced cost or free when they are completed.

While a license that would allow the user to transfer the product from machine to machine or between facilities would be best for both economy and legality, agreements of this type are rare. Vendors must keep some form of control over their products to retain copyright protection. If the software were allowed to roam indiscriminately throughout

organizations the possibility of the product becoming public domain increases because of the high level of exposure. This lack of effort to police the product is what caused TIMENET to lose its legal protection. [Ref. 26] Most vendors realize that limitations in the licensing agreement are the only way they have to police their product. These limitations apply to both mainframe and Personal Computer (PC) software. [Refs. 20,21,26] In any event these agreements apply equally to the documentation which accompanies the software.

Although many vendors believe that users are essentially honest, they feel that some monetary recompense is essential to make these agreements effective, since it is inevitable that some part of the product will migrate to an unauthorized party. The more a user wishes to do with a product, i.e. move it about the organization, or use it on various computers, the higher the dollar value. The drive for economy can prove fatal in the long run. While the wide variety of mini and mainframe computers in use throughout the Government would make it uneconomical to move programs for these machines easily, the proliferation of microcomputers in Government agencies make the practice of moving and/or copying diskettes both appealing and easy. However, an "economical" license makes this highly illegal. One Government installation acquired a microcomputer and some vendor supplied software. The agreement for the software stipulated that the software was to be used only on that machine. [Ref. 20] If additional

computers were obtained from the same vendor either the software agreement must be renegotiated or additional identical software must be acquired. It should be noted that it is not always necessary to have a program per computer. There have been instances where installations have procured software which has been legally run on all computers at the installation. [Ref. 20] It may be more economical to acquire a more expensive license in order to facilitate expansion. If this is done the contracting officer must also take into account the precepts of maximum competition, as the availability may severely limit those who could bid on future ADPE acquisitions. This situation is similar to the case of having a certain manufacturer's hardware on hand when attempting to justify a sole source hardware procurement. Here the software would be the driving factor in a sole source procurement.

It would appear that these agreements would be hard to enforce. It is difficult for vendors to keep products where they belong. To enforce the agreements some vendors keep extensive records as to who/what user has a product and the rights assigned. [Ref. 26] Breaches of contract are detected when unauthorized users request service for the software or request further documentation. [Ref. 26] While these instances are often unintentional and usually done through ignorance, they are, none the less, infringements on the exclusive rights of the copyright holder and breaches of contract. Infringement of micro computer software is not as

easily detected. Normally the only way the copyright holder learns of the infringement is through word of mouth. [Ref. 27] In any case the user has three alternatives to choose from. The user can either buy a license, destroy the improperly obtained software, or go to court.

It can be seen that the licensing agreement is basically an assignment of rights to the user. These rights are normally assigned sparingly or at great cost. Currently there is guidance only in the DFAR concerning the acquisition of rights. The DFAR, however, only applies to DoD components and not to the Government as a whole. The DFAR takes a more hard line approach to acquiring rights and is somewhat specific in nature, while other guidance is much more general in nature and gives vendors greater latitude. There are general statements in the various guiding documents which dictate that Government agencies shall strive to obtain the least restrictive license possible, but in view of the 1976 Act and its 1980 amendment it appears that contractors are well within their rights as copyright owners to assign rights as they see fit.

As stated earlier many software producers will not do business when contracts call for unlimited internal copying, this issue is mostly confined to the PC world. With the ever widening use of micro computers in the Government, this will soon become a major concern. It is quite difficult for vendors to guard against piracy. As more and more people have

access to PCs both at home and at work it will become even more difficult for producers to maintain their protection and vendors will become even more jealous when assigning rights to their product. Since the Government must act within the law, one possible way to avoid extensive contract renegotiations and possible legal problems is to acquire multiple copies of the product. This does not mean the archival copy that users are entitled to make and keep under the 1976 Act, but copies to be used. Vendors are not adverse to doing this.

The idea of copies applies to documentation as well as the program. Like the software, the documentation is copyrighted. Any copying of the documentation is an infringement of the author's exclusive rights. The DFAR states that when software is acquired with restricted rights the accompanying documentation will be acquired with limited rights. [Ref. 19: 27.404-1] In any contract mention must be made of documentation. Like the program, the documentation also undergoes updates and upgrades to reflect the changes in the software.

With all the recent attention given to software piracy it would seem to be a relatively simple undertaking to find an employee who is capable of copying a program. To protect against this, or from an overzealous employee doing it on his own, vendors can, with the cooperation of manufacturers, use the CPU serial number as home in many PC software products. [Ref. 26] When the software is initially loaded the serial

number of the CPU is read from the hardware and written into the software. In subsequent uses the serial number which has been written into the software is checked against the serial number of the CPU of the hardware, if the numbers do not match the program will not function properly. [Ref. 26] This feature will not allow the product to be run on another computer once it has been run, since serial numbers cannot be altered. While some ingenious individuals may find a way to copy the program, or even circumvent this feature, the vast majority will not run correctly. It may take more time and effort than is realistic to make them run correctly. Obtaining several copies of PC software will decrease the possibility of employees making illicit copies for use on other machines in the office or for their personal use. Either action is contrary to present statutes, and as noted earlier, the Government is not immune from prosecution if it infringes on an author's exclusive rights.

As can be seen, up to this point there is currently no guidance for many aspects of software acquisition for non-DoD agencies. None of these questions, with the exception of PC software piracy, are new. The policy vacuum in these areas has led to great diversity of software in use in Government facilities. It has also led to various agencies, even within DoD, to adopt somewhat different practices. Moreover, the lack of guidance has caused programs and exchange centers with

duplicate purposes to be established, and many of these centers are under or improperly utilized.

An example of this is the difference between Army acquisition and that of the Navy. Army installations have bought a number of PC's and have the ability to run the software on any of the machines with upgrades or updates supplied by the vendor at no cost. [Ref. 21] This acquisition is in direct contrast to the previously mentioned Navy acquisition where the software could be run on only the specified computer. These two acquisitions are not meant to be representative of either agency's practices, but rather to illustrate the range of diversity between agencies caused by the lack of specific guidelines. Guidance in these areas would fill the void between these two extremes and educate those who must procure software from commercial sources.

One final aspect which lacks specific guidance and can influence the cost and approval authority of software is the form of the product. The form of the product not only affects cost, but can present some legal questions for the user. These factors arise, once again, from vendors' fear of losing control over their product.

Most software for mini and mainframe computers is sold in object code form. In this form software is less expensive; and vendors feel that binary code is so difficult to understand and alter that this in itself is adequate protection.



Source code on the other hand, is much easier to understand and modify and priced approximately 2 to 3 times higher than object code. [Ref. 26]

Users would opt for source code if they wished to later modify the product. When code is issued in this form the license normally requires that any modified copy of the software be returned to the copyright owner of the original work. Moreover, unless specific clauses are included in the licensing agreement, the altered versions would be the property of the original copyright holder. If no transfer of ownership were to take place then the user would necessarily need to negotiate a new contract. The high cost and the requirement to return modified versions of the product make the acquisition of source code undesirable. Although there is no guidance in this area its lack is of minor consequence.

The legality of the product could prove both costly and embarrassing for any Government agency. The issue of product legality and the reputation of the firm are directly related. The FAR contains specific guidance in this area. Although the sections of the FAR which address this issue pertain to all facets of Government contracting aspects of the material are especially applicable to commercial software.

Section 9.104-1 of the FAR delineates the general standards a prospective contractor must meet in order to be considered responsible for the award of a Government contract.

These standards include the possession of adequate financial resources, the ability to comply with the delivery or performance schedule, a satisfactory performance record, a satisfactory record of integrity and ethical behavior, the necessary organization, skills, and operational controls, the necessary physical resources, and to be qualified under present laws and regulations to receive the award. All of these standards are important, but the issue of integrity is especially so when the legality of the product is concerned. Software for mainframe computers, being generally custom-made for the application and the machine type, although not immune from containing material copyrighted by another, is not highly suspect in this area. A real danger is posed by PC software. Many software houses or manufacturers which produce both hardware and software, emphasize the compatability of their software with the hardware of various companies. It is this aspect which lead to products which infringe on the rights of others. [Ref. 26]

In some instances companies striving to widen the market for their product through compatability use part of another program, such as the input/output routine, to make the product compatible with various computers. Some of these products are discovered and the offended party seeks legal redress. Many instances of this type are not discovered, due to the difficulty in finding the piracy. Infringement of this type

is not limited to small companies. Franklin Computer Corp. and Eagle Computer Inc. have both been found to have infringed upon the software of other companies. [Refs. 16,18] In one of these cases an injunction was placed on the infringing party with respect to the software in question. The injunction stated that officers of the company "...Shall erase or destroy all documents and physical things that are in their possession, custody or control..." [Ref. 16]. If the Government had acquired this product it would have been forced to stop using that software. This would have disrupted operations and inevitably led to a great deal of unfavorable coverage in the press. It would have also lead to the acquisition of another software package.

The guidance in this area states that a contractor shall be considered nonresponsible if he/she is or has been seriously deficient in contract performance. [Ref. 24: 9.104-11] Breaking the law would certainly give any vendor an unsatisfactory record of integrity, and cast serious doubts as to its ability to satisfactorily fulfill a contract. Placing an injunction on the offending party is one of the legal actions an offended party takes with the concurrence of the courts. If the user is unable to use the product the contractor has been deficient in the performance of the contract.

Information concerning the contractor must be possessed by the contracting officer before making a determination of nonresponsibility or unsatisfactory record of integrity.

[Ref. 24: 9.105-1] This information is obtained shortly after a bid opening or receipt of offers. In negotiated contracts the information may be obtained prior to issuing the request for the proposals. Requests for information of this type shall be limited to the low bidder or those in the range for the award. [Ref. 24: 9.105-1]

FAR guidance describes the sources of information to support determinations of nonresponsibility. These sources include the GSA maintained Consolidated List of Debarred, Suspended, or Ineligible Contractors, records and experience data such as verifiable knowledge of personnel within agencies, the prospective contractor, and sources such as publications, other customers of the contractor, business and trade associations, and other Government agencies. [Ref. 24: 9.105-1] The vast number of software producers make a review of all sources important. While a review of this magnitude will probably prove to be extremely time consuming, the problems posed by acquiring an illegal product make the time a worthwhile investment.

The question arises about software acquired without a contract. Acquisitions of this type would be essentially within only the PC area. An instance of a case like this may be the immediate need for an off-the-shelf program available at a software retail store. In this situation there is no

contract, and more than likely, no third party agreements involved. Is the Government entitled to unlimited rights in an instance such as this? The answer is no for a number of reasons.

First there is no contract ennumerating rights or limitations. While copyright notices are not considered to be restrictive markings by a contractor in the DFAR, in this case there is no contractor, and the copyright notices are sufficient to keep a user from unauthorized duplication. [Ref. 28] It is unreasonable to assume that a software producer would know when the Government procures its product and then request the Government to allow it to place restrictive markings on the product. Secondly, it is the policy of Federal Agencies to enable authors to protect their work. Unlimited rights are gained when the software is in the public domain and when the Government supplies the funds and resources required for the product. In the case of off-the-shelf acquisitions from a retailer, the user must abide by the provisions of the 1976 Copyright Act. [Ref. 28] Any action which infringes on the exclusive rights of the copyright holder may not be done without permission of the copyright holder. Finally there is the question of the power of the retail sales person. He/She may have implied power, but not the permission of the copyright holder to extend unlimited rights in the product. Users cannot make assumptions in this area.

The restrictive markings mentioned in the preceding paragraph are required by the DFAR, and therefore required in military contracts, but not for other Governmental agencies. If software is received with the restrictive legend missing, or in question, it shall be assumed that it has been acquired with unlimited rights. [Ref. 19: 27.404-2] However, several actions must take place before the software may be used with unlimited rights, and until any misunderstanding has been clarified the Government must abide by the asserted restrictions. [Ref. 19: 27.404-2]

If the legend is questionable, i.e. the product has restrictive markings but may not have been acquired with restricted rights, the Government must inquire as to the validity of the markings. The inquiry must be answered by the contractor within 60 days, fully identifying the restrictions in the contract. If the inquiry is not answered within the prescribed time limit, or if the restrictions are not fully identified, the Government may then cancel or ignore the markings and use the product with unlimited rights. [Ref. 19: 27.404-2]

If the software is delivered without a restrictive legend, the contractor may request permission to place a legend on the software at his own expense. The Government may authorize this if it is proven that the legend is allowed

by the contract and if the omission was accidental. [Ref. 19: 27.404-2] While the restrictive legend may be allowed to be placed, its absence releases the Government of any liability of improper use, duplication, etc. [Ref. 19: 27.404-2]

## VI THE BETAMAX DECISION

The Betamax decision is the name commonly applied to the Supreme Court decision in the case of Sony Corporation of America vs Universal Studios, Inc.. The Betamax case concerned copyright infringement by the manufacturers of video tape recorders (VTR). Universal Studios held that Sony was contributing to copyright infringement by selling VTR's for home use, allowing individuals to copy television broadcasts. This case was first argued before the U.S. District Court for the Central District of California, 480 F. Supp. 429, where the decision went against the copyright owners. The appeal was heard by the U.S. Court of Appeals for the Ninth Circuit, 659 F. 2nd 963, where the earlier decision was reversed. The case was first heard by the Supreme Court on 18 January 1983, it was later reargued on 30 October 1983, and finally decided on 17 January 1984. The Court in its decision held that the "manufacturers' sale of such equipment (VTR's) to the general public did not constitute infringement of respondents (Universal Studios) copyrights." [Ref. 29] The decision of the Court of Appeals was reversed and Sony was not liable for restitution to Universal Studios since it could not control the use of its machines or the copyrighted works of others. [Ref. 29]

While the Betamax decision deals mainly with contributory copyright infringement by an equipment manufacturer and



television broadcasts, the decision does hold implications for the computer industry and the Government's interest in software copyrights. The points relevant to computer software issues include fair use, commercial vs non-commercial use, present and future harm to the market of the copyrighted material, and the consumer.

In the Betamax case Universal brought no action against individual consumers, rather the action was brought against a large corporation. [Ref. 29] This was done due to the number of VTR's in use in this country. Estimated to be in the millions, it would be uneconomical for a copyright holder to seek to recover damages from every individual, if indeed they were all infringing on the copyright holder's exclusive rights. Software manufacturers likewise do not seek relief against the "small time" infringers for economic reasons. [Ref. 28] They have sought relief against large corporations. [Refs. 16,18,26,27]

In the eyes of the software manufacturers/copyright holders the Government could be viewed as a large corporation. While it is questionable that the Government could be sued for contributory infringement as per the Betamax case, it is possible that it could be sued for infringement. The question remains if an infringement action is brought against the Government as a whole, the particular agency involved, or an individual such as a cabinet member, agency head, commanding officer, or a specific employee. It seems unlikely, due to

the time and money involved, that action would be brought against an individual. [Ref. 28] However, it could prove feasible for a suit to be brought against an agency or the Government, even with the difficulties involved in suing the Government.

In any suit concerning copyrights the issue of commercial use is an important factor. In the Betamax case it was held that the copies were made for private non-commercial use, that the machines were not controled by the manufacturers, and that the manufacturers could not control the individuals using the machines. [Ref. 29] The Government does control both the machines and the individuals under its cognizance when the machines and the individuals are in Government facilities and on Government time. In the case of a Government computer the copies would probably not be held to be for private non-commercial use.

While video tapes for home viewing are used mainly to watch a program when time is available, and not when the program is aired, the primary reason for copying a computer program would be to use it without expending the effort to write it or expend the resources to pay for it. Like Sony, the manufacturers of computers would not be liable for any copying. However, the Government, which exercises some control over its resources, could be held liable. The copies of the product could be considered to be of commercial use since they are property, intellectual property, received without

payment. While the Government may not be reselling the material for a profit, it is certainly gaining a commercial advantage by not paying for it.

Even if the use is deemed to be non-commercial it may not be the end of the legal action. If a vendor can prove that use of the product is harmful; or could cause harm to the potential market of the product if use becomes widespread then a suit could be successful. If the illicit copies are used for commercial gain then the likelihood of market harm is presupposed. [Ref. 29] In neither case is positive proof required, only that a "meaningful likelihood of future harm exists". [Ref. 29]

It seems impossible to imagine where any copying of software by the Government, with the exception of making archival copies, would not harm the vendor's market. As stated previously, copying software would most likely be done with PC software. The growing numbers of PC's in Government offices would certainly impair the vendor's ability to market his product. The vendor obviously loses at least one portion of one of the largest existing software markets, the Government. Moreover, the product may also be copied by individuals for private use. Copyright holders would be much more likely to bring action against the Government rather than the individual primarily because likely market harm would be easier to demonstrate.

Finally the issue of fair use must be examined. Even after the Betamax case fair use is not fully defined. The Court had some difficulty in dealing with the issue, and stated so in their decision. [Ref. 29] In Betamax the material copied, public television broadcasts, were free to the public at large and the copyright holder was being paid for the material in the license to broadcast. In the case of software the lease payment or purchase price is the only means by which the copyright holder may recoup costs. Moreover, a copy of a computer program would not fall into the same category as a public television broadcast, and the copies of software are not analogous to a VTR copy. A VTR copy is used primarily for convenience and not to get something for nothing, as would be the case in a software copy. [Ref. 29] All of the factors mentioned in the Betamax case show that the Government can be held liable for infringement. The Government has control over the products, can cause some harm to the copyright holders market, and can use the product for commercial purposes.

One factor which may affect whether or not a suit is brought against an organization or an individual in the organization is control. If the restrictions which must be placed on the software by the DFAR are strictly adhered to there will be no basis for legal action. If those same restrictions are ignored by individuals and the practice is

condoned by management then control is not exercised as it should and any potential legal action has some possibility of success. Management, in this case commanding officers and agency heads, must not allow their subordinates to act contrary to copyright laws and the restrictions placed on software by Government contract clauses.

## VI. CONCLUSIONS

As the reader may have surmised by this point, the world of software is fraught with danger in the area of copyrights. From the Government's point of view there are two major concerns: The first is the possibility of becoming embroiled in legal proceedings which may involve breach of contract or infringement actions; and proper planning for intelligent and economic contracts.

While it is undoubtedly difficult to bring legal action against the Government it has been successfully done as witnessed by the map incident previously mentioned. In that case the laws have been in place for sometime and the technology relatively well known. In any case involving software the law is rather new and lacking precedents, the technology is also new, not readily understood by everyone, and constantly changing. While one copyright case has been argued before the Supreme Court involving current technology, it was primarily involved with contributory infringement on the exclusive rights of the copyright holder. However, one issue often referred to by some, and voiced by the plaintiffs in the Betamax Case, is the fact that copyright holders will only pursue action against large entities and not individuals.

The present environment in the software industry can cause the Government, or any large corporation, some legal problems. The majority of these problems can be avoided by assuring any software contracts contain specific clauses which are fair to both the copyright holder and the Government. The remaining problems can be minimized by management control and employee education.

Contract clauses pertaining to the rights afforded to the user, in this instance the Government, are all important. When negotiating a contract for software, flexibility for the Government and protection of the copyright holder's rights are the primary concerns. Both of these factors must be held in mind. The Government must have a clear idea of what is required, desired, and what is the long range purpose of the acquisition.

A clear definition of requirements and purpose is of the utmost importance for both legal and economic reasons. Once a contract is signed and the product delivered the user is constrained by the clauses of the contract. If an expansion of the use or a transfer of the software is deemed necessary at a later date, and the contract holds no provision for this, the user is constrained by the contract. All indications from the interviews conducted during the writing of this thesis show that most Government agencies would not act contrary to any contract clause. [Refs. 20,21,26,28] It is also unlikely

that the many contracts may require renegotiating during the life of the product.

The scope of rights for use of the software, be they unlimited, limited, or restricted, are essentially derived from what the Government inputs to the product are. If the product is built from the ground up the amount of Government input into the development process influences the subsequent scope of rights. Definitions of the various types of rights and how to qualify for each have been previously identified and will not be reiterated here; however, identification can and should be made early. Time devoted to reading the DFAR to ascertain the various types of rights and how they are acquired early in the procurement process would be time well spent as it may, in some cases, eliminate future problems concerning the use of the product.

Portability of the software is one particular clause which should be covered in the contract. Many large applications have geographical restrictions placed in the contract. [Ref. 26] This should be taken into consideration prior to any contract acceptance. If a Government owned computer, or its designated backup, should have to be moved for whatever reason it may, ~~not~~ be within the limits of the contract to move the software with the machine. This is one aspect of software procurement that may not be within the responsibility of the procuring activity as it may not be cognizant of any



impending geographical shifts. In many instances this may seem to be an aspect of the procurement which could be ignored, such as the Pentagon or Naval Postgraduate School, relatively stationary entities; but the possibility of regional recruiting offices or small reserve centers moving should not be ignored.

Portability may not always be a concern, but machine use will almost certainly be one. Many vendors limit the use of their software products by machine serial numbers, and most Government contracts provide for this by naming the primary machine and designating a backup. In the case of applications for mainframe computers this would be a concern if there is a change of machine either pending or contemplated. However, owing to the lead time required for hardware acquisitions this aspect of rights may be unwittingly overlooked and cause problems in the long run. The influx of micro-computers into offices creates a real problem in this area. An office may receive one PC and acquire software to go with it. If the PC turns out to be successful it is natural to get more PC's and then make copies of the existing software to run on the new machines, or to run the existing software on the new computers. Making copies is obviously contrary to federal statutes. Running the programs on the new machines may be contrary to the terms of the contract. Consideration of hardware change or the expansion of facets of office

automation early in the software acquisition can save frustration at a later date.

In concert with machine use is the issue of copies. Are multiple copies necessary? In the case of PC's this could easily be the case. Like machine use, this should be considered early so as to avoid problems later.

A final aspect to consider is improvements in the product. Some vendors offer updates or upgrades free, or at substantially reduced prices. These improvements may not be required if the original requirements were well thought out, but they may prove to be beneficial nonetheless. An operating system for a mainframe may increase the speed of applications or utilize memory more efficiently, while PC applications may have been condensed and use less memory. Any improvements may prove beneficial not as improvements in themselves, but by how they allow computers to be free to do new and different things.

The five aspects discussed, if considered early in the acquisition process can prove to be valuable in terms of freedom of use and economy during the life of the product or computer system. Changes in systems can cost time, manhours, and possibly money to be needlessly consumed in contract renegotiation if contract clauses do not allow the Government sufficient flexibility. What may seem to be the most economic of contracts may prove to be an expensive blunder. Long range

plans should be part of the procurement process, with any implications concerning the ADP environment made known to the ADP personnel. While the contracts may appear on the surface to be more expensive, Government flexibility will be enhanced and the costs could be reduced over the long run. As the computer industry as a whole expands, flexibility for computer systems, especially software components, will become more and more important. While it may appear on the surface that these considerations deal primarily with contracts, copyrights heavily influence these areas. Each item discussed deals with protecting the rights of the copyright holder.

When a user trespasses on the exclusive rights of a copyright holder infringement occurs. For software, infringement would involve copying all or part of a program. It should be re-emphasized at this point that the idea or purpose of the program is not protected, but the embodiment of the program, the specific code, is covered by copyright law.

Infringements in the area of mainframe machines appear to be rare. While researching this subject cases of infringement were not to be found in the area of mainframes. This may be due to a number of reasons. Applications are often married to the operating system of the computer, or the language for the application may not be available on all mainframes. As for operating systems, the very idea of understanding the coding and inner workings of one is beyond all but the most experienced and talented programmers. Often

copies of large sophisticated programs do not work well for various reasons, and vendor maintenance is not available for purloined software. Vendors maintain records as to who has a copy of programs, and if a user with a spurious copy is foolish enough to request maintenance, action is taken by the vendor [Ref. 26] It is essentially economics which deter users from infringing on mainframe software. [Ref. 26] Economics in the form of programmers with the ability to understand and service complex software; and a fear of actions by vendors if they are discovered with a bootleg copy of their product.

Economics is the very reason that infringement is such a danger in the PC environment. Software is relatively inexpensive and difficult for the copyright holder to keep track of. Why buy more than one copy of a program when it can be easily copied and distributed throughout the installation to compatible machines? While there is undoubtedly some copying done at Government installations and the copies used at the installation, this practice appears somewhat limited, and is not condoned by management. In the main where PC's are few in number, copying is non-existent.

The numbers of PC's in Government offices and the huge numbers of applications which exist, coupled with the relative newness of office automation, make it very attractive to have all the application packages possible on hand. It is much

more convenient to have the appropriate program at one's desk than to have to get it from someone else. Managers are quite cognizant of this and would normally acquire an adequate number of copies for everyone concerned to work efficiently.

However, since all types of excellent software are available at the office it would almost seem foolish for individuals to buy software when it is so easy and inexpensive to copy the products at work for use at home. Actions of this type by Government employees can be cause for infringement action by copyright holders. While legal proceedings have been brought against Government employees in copyright cases, these actions bear a strong resemblance to the Betamax Case. It has been previously stated that copyright holders have no strong desire to prosecute individuals, but rather large entities where the successful conclusion of proceedings could prove monetarily rewarding. The Government certainly qualifies as a large entity.

Infringement could prove expensive in damages and because of work stoppage due to injunctions. Moreover, it could prove to be extremely embarrassing. The Jack Andersons of the world would like nothing better than to publicize a scandal in an area where the Government is considered to be far behind the commercial sector because of the myriad of regulations. Nightmares such as these can be avoided with some simple prior planning. Management control and a simple education program can avoid these problems.

It may seem that infringement may be a small problem, difficult for copyright holders to discover, and not a major concern. This is not necessarily the case. One security concern is disclosure from disgruntled employees; if there are infringement activities taking place at an installation a dissatisfied employee may inform the copyright holder of these activities. It has been pointed out earlier in this paper that the majority of infringements are discovered via word of mouth. [Ref. 21] While it is not the purpose of this thesis to illustrate ways to keep all employees happy, or to silence the unhappy ones, there are ways to minimize the risk and/or instances of infringement.

The Department of Defense has already taken meaningful steps towards management control by requiring markings to be prominently displayed on all software received from a contractor. [Ref. 19: 27.404-2] If nothing else, employees are alerted to the fact that indiscriminant copying is not DoD policy. With the number of code breaking programs now available such as "Locksmith", now in its fifth revision, it should not be assumed that all computer users realize the impropriety of program copying. On the whole DoD, in its supplement to the FAR, takes a much firmer stance on the issue of rights and use than other Federal agencies which are not required to follow the DFAR, and ensures that contractors place restrictive markings on software. This is the first step toward effective control: Making the user aware that it is not the policy of the employer to condone copying.

Unfortunately the restrictive markings required by the DFAR are the only apparent attempts at any type of management control practiced by the Government. As unlikely as it may seem, apparently no inventories are held when managers are transferred (at least in the Navy). [Ref. 30] If the military, with its strictness doesn't perform an inventory it is doubtful that other Government agencies would. It should be noted however, that the large numbers of Government offices and installations, military and non-military, make the acquisition of data from a meaningful sample size extremely difficult.

Inventories for software could be carried out in much the same manner, and with the same timing, as those for high value and pilferable items aboard ships. Software is indeed a high value item and is pilferable; there is no need to elaborate on these assertions. An inventory would show that the software is still in the possession of the user. While seemingly a minor point, it is the responsibility of the user to exercise some type of control over items received from a vendor where the vendor retains some interest or rights in the product. The issue of market harm was one of the salient points brought out in the Betamax case. The loss of software could cause possible harm to the vendor's market depending on the application, as well as showing the Government to be irresponsible, and present the possibility of a contributory infringement action similar to the Betamax case.

Inventories would do little to curb infringing actions by individuals. However, they would show all concerned that software is a highly valued item taken seriously by management. Indiscriminant lending would be minimized so that cognizant officers would retain control over their resources. If for no other reason, the inventories would allow managers to know what software was destroyed in a catastrophe such as a fire or earthquake and inform the vendor that particular copies of his/her product have been destroyed.

If surreptitious copies were uncovered during the inventory they could either be destroyed, surrendered to the vendor, or purchased from the vendor. While none of these actions are particularly tasteful, they would preclude the possibility of legal action being taken against the Government, as it was the Government who discovered and announced these actions and offered to surrender or buy the copies.

Other forms of management control could include procedures similar to those used for CMS materials in communications stations. While these would be extremely effective measures from a control standpoint, the severity of the controls would seem to defeat the purpose of ADP; i.e. speed and ease of access. A lock and key approach could be employed at large DP centers, but would have little effect as micros become more widespread. Personal responsibility could be assigned to individuals, but the numbers of employees who have access to computer resources make this approach rather



unwieldy. There is no clear cut way to control software, and, to a large extent, the Government must rely on its employees to be faithful to the laws and policies.

It is possible that many employees are not aware of the ramifications of copying programs or parts of programs. To remedy this an education program could be implemented. The program need not be long or highly taxing. In its most simple form it could be a short reading to be signed by newly reporting personnel. This would accomplish two objectives:

- 1) Inform personnel that particular actions are inappropriate, illegal, and against policy, and may be punishable.
- 2) Show employees that the Government has control over its resources and wishes to protect both those resources and the employees.

This idea is similar to reading the Navy Safety Instructions. Every sailor eventually works with the Navy tag-out system. That system demands a knowledge of the Navy Safety Instructions. At least in theory every sailor has read these instructions. Some ships have installed programs where crew members must read these documents and sign a sheet stating that they have read and understood them. Readings as large and detailed as the safety instructions would not be required in this case. A short, not more than two page essay identifying improper actions, defining what the restrictive markings on software (DoD only) mean, stating that Government employees have been prosecuted for infringement activities, and ending

with a space for signiture would suffice. The paper could be inserted into appropriate personnel records so that the procedure would not have to be repeated for those people who work at ADP installations often. For the vast majority of individuals the knowledge of what is right and what is wrong is sufficient.

The negotiation of contracts is a long and difficult process which must be planned well in advance. Nowhere is this more true than in software. What may appear to be economical today may prove to be a monumental blunder tomorrow. As the Government turns more and more to automation the rights of the software author will become more prominent in contracts and the general price of software. Each procurement may be different, but two items will always be important aspects of each acquisition; the rights of the author, and flexibility for the Government.

Both of these items are protected by law, and neither would logically be trespassed intentionally. However, the proliferation of computers and the severe competition in that field allow for some unscrupulous and/or uneducated individuals to cause severe harm to the copyright holder. As in contract planning, prior preparation and identificatin is the key to success. Education of everyone concerned will enable the law to be followed not only to the letter, but also in spirit.

The technological strides being taken, especially in the realm of computers, will bring new interpretations to copyright statutes. Throughout the U.S. computer related statutes are being updated in various states, as well as the federal arena, to reflect the new technology. [Ref. 31] It is only reasonable that the Government take control of its copyrighted material and inform those who use it of the proper ways in which to use it. The interpretations of the Supreme Court have placed the onus for changing the law on Congress. [Ref. 29] While it may be some time in coming, pressure will be brought to bear on that body to change the law in the future. By taking control of these resources now, early in the cycle of change, the Government will be better equipped and experienced to adapt in the future.

## APPENDIX A

COPIES-- "Copies are material objects, other than phonorecords, in which a work is fixed by any method now known or later developed, and from which the work can be perceived, reproduced, or otherwise communicated, either directly or with the aid of a machine or device. The term 'copies' includes the material object, other than a phonorecord, in which the work is first fixed." [Ref. 6: 101]

DEVICE-- "A 'device', machine', or 'process' is one now known or later developed." [Ref. 6: 101]

FIXED-- "A work is 'fixed' in a tangible medium of expression when its embodiment in a copy or phonorecord, by or under the authority of the author, is sufficiently permanent or stable to permit it to be perceived, reproduced, or otherwise communicated for a period of more than transitory duration." [Ref. 6: 101]

LITERARY WORKS-- "'Literary works' are works other than audiovisual works, expressed in words, numbers, or other verbal or numerical symbols or indicia, regardless of the nature of the material objects, such as books, periodicals, manuscripts, phonorecords, film, tapes, disks, or cards, in which they are embodied." [Ref. 6: 101]

PUBLICATION-- "'Publication' is the distribution of copies or phonorecords of a work to the public by sale or other transfer of ownership, or by rental, lease, or lending.... A public performance or display of a work does not of itself constitute publication." [Ref. 6: 101]

USEFUL ARTICLE-- "A 'useful article' is an article having an intrinsic utilitarian function that is not merely to portray the appearance of the article or to convey information. An article that is normally a part of a useful article is considered a 'useful article'." [Ref. 6: 101]

WORK OF THE UNITED STATES GOVERNMENT-- "A 'work of the United States Government' is a work prepared by an officer or employee of the United States Government as a part of that person's official duties." [Ref. 6: 101]

WORK MADE FOR HIRE-- "A 'work made for hire' is:

(1) A work prepared by an employee within the scope of his or her employment; or

(2) A work specifically ordered or commissioned for use as a contribution to a collective work,...as a translation, as a supplementary work, as a compilation,...if the parties expressly agree in a written instrument signed by them that work shall be considered a work made for hire. For the purpose of the foregoing sentence a 'supplementary work' is a work prepared for

publication as a secondary adjunct to a work by another author for the purpose of introducing, concluding, illustrating, explaining, revising, commenting upon, or assisting in the use of the other work, such as forewords, afterwords,...charts, editorial notes,... appendixes, and indexes...." [Ref. 6: 101]

TRANSFER OF COPYRIGHT OWNERSHIP-- "A 'transfer of copyright ownership' is an agreement, mortgage, exclusive license, or any other conveyance, alienation, or hypothecation of a copyright whether or not it is limited in time or place of effect, but not including a nonexclusive license." [Ref. 6: 101]

## APPENDIX B

TABLE 1  
Characteristics of Protective Mechanisms

Considerations	Copyright	Patent	Trade Secret
<i>General</i>			
National uniformity	Yes	Yes	No
Protection effective upon	Creation of work	Successful prosecution of application	Entrance into contractual relationship
Cost of obtaining protection	Nil	Moderate	Moderate
Term of protection	Life plus 50 years or 75 years	17 years	Possibility of both perpetual protection and termination at any time
Cost of maintaining protection <sup>1</sup>	Nil	Nil	Significant
Cost of enforcing rights against violators <sup>2</sup>	Moderate	Moderate	Higher
Availability of (a) statutory damages (b) attorney's fees from infringers	(a) Yes (b) Yes	(a) No (b) Yes	(a) No (b) No
Protection lost by	Gross neglect	Unsuccessful litigation	Disclosure
<i>Software, including effects of Commission proposals</i>			
Consistency with other copyright areas	Yes	No	No
Availability of protective mechanism for some programs <sup>3</sup>	Yes	Unclear	Yes
Universal availability of protective mechanism for all programs <sup>4</sup>	Yes	No	No
"Process" protectible	No	Yes	Yes
Suited to mass distribution	Yes	Yes	No

[Ref. 32]

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